

National Exams May 2003

98-CS-2-Engineering Society - Health, Safety and the Environment

3 hours duration

Notes:

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.
2. This is a Closed Book exam. No calculators are allowed for this exam.
3. Any five questions constitute a complete paper. Only the first five questions as they appear in your answer book will be marked.
4. All questions are of equal value.
5. Write your answers in point-form whenever possible, but fully.

Front Page

National Examination May 2003
98-CS-2, Engineering in Society - Health, Safety and the Environment

1. (i) Explain the emphasis placed by Occupational Health and Safety Act (OHSA) to deal with new hazards in nontraditional sectors of industry.
(ii) Bureau of Labour Statistics data indicates that accidents and injury rates are much higher for smaller companies (between 20 and 250 employees) than for larger ones. Explain the manner by which accidents and injury rates can be minimized especially in smaller companies.
(iii) What are the responsibilities of employers and employees under OHSA act?
2. (i) Explain the manner by which accidents can be prevented in industry.
(ii) State the means of hazard elimination and accident avoidance. Give examples.
(iii) What are the means used for equipment failure minimization?
3. (i) State the procedures that are followed in conducting a formal safety inspection of an industrial plant.
(ii) Explain the manner by which an accident investigation is carried out in industry.
(iii) In the context of accident investigation discuss the following: (a) accident reports, (b) corrective actions, and (c) insurance claims.
4. (i) What are toxic substances and their effects on human body?
(ii) How are the toxic agents detected? What are the typical industrial operations that require the use of respiratory protective equipment and protective clothing?
(iii) State the various types of air contaminants. What are the basic approaches to measuring air-containment exposures?
5. (i) State the engineering controls that can be used to reduce vibration and noise levels in industry.
(ii) What are the means of isolating sources and isolating personnel of noise exposure?
(iii) Explain the effects of vibration and noise on personnel, equipment and operation.
6. (i) What are the basic objectives of fire protection, prevention and control?
(ii) State the various means by which fire can be suppressed.
(iii) State the characteristics of various fire detection systems.
7. An employee was struck by a 5-ton riveting machine which fell while he was moving it with a wall-mounted electrically controlled crane. The machine fell because the lifting eyebolt assembly had failed: the nut holding the machine to the lifting eyebolt came off.

(i) Determine the cause of the fatal accident.
(ii) State the corrective actions required.
(iii) Suggest the follow-up action required.